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ABSTRACT

A qualitative study was undertaken to create lesson plans that integrate science and social studies with the hope that teachers will expand them and incorporate them into their curricula. An instructional package of lesson plans that teachers can use to integrate the science and social studies curriculum was devised. The "Mississippi State Department of Education Curriculum Guidelines and Objectives for Social Studies" (1995) contains 15 competencies at the fifth-grade level. Three standards from the National Science Education Standards (1996) were chosen: science and technology, science in personal and social perspectives, and the history and nature of science. Each competency for the social studies has three lesson plans that integrate the selected three standards from the National Science Education Standards. A total of 45 lesson plans were written integrating science and social studies. Each lesson plan includes an objective, materials, procedures, and evaluation for teachers. Teachers are encouraged to use the lesson plans as guides to create lessons that correspond to their school's particular curriculum guidelines. Consideration should be given to the learning levels and learning styles of the classrooms. (Contains 45 references.) (BT)

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An Instructional Package Integrating Science and Social Studies Instruction at the Fifth Grade Level

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ABSTRACT

Integrative education is being implemented by classroom teachers who want to immerse students in an environment rich in problem-solving skills, critical analysis skills, ethics, valuing of knowledge, and communication of learning. Several subject areas in the curriculum have been integrated, such as literature with social studies and mathematics with science. The focus of this dissertation is on the integration of science and social studies at the fifth grade level using the Mississippi State Department of Education Curriculum Guidelines and Objectives (MSDE, 1995) and the National Science Education Standards (National Research Council [NRC], 1996).

An instructional package of lesson plans that teachers can use as ideas to create their own plans for an integrated curriculum of science and social studies was devised. The Mississippi State Department of Education Curriculum Guidelines and Objectives for Social Studies (MSDE, 1995) at the fifth grade level contain fifteen competencies. Three standards from the National Science Education Standards (NRC, 1996) were chosen. They include (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science. Each competency for social studies has three lesson plans written that integrate the three chosen standards from the National Science Education Standards. A total of forty-five lesson plans were written integrating science and social studies. Each lesson plan includes an objective, materials, procedures, and evaluation for teachers. Teachers are encouraged to use the lesson plans as a guide in creating their own lesson plans that would correspond to their school's particular curriculum guidelines. Consideration should be given to the learning levels and styles of their classroom.

This qualitative study was done to create lesson plans that integrate science and social studies with the hope that teachers will expand upon them and implement them into their curricula.

INTRODUCTION

The integration of science and social studies into the curriculum through the use of The National Science Standards (NRC, 1996) and state curriculum guidelines at the fifth grade level could be beneficial to teacher preparation and student learning. The curriculum integration of science and mathematics has been implemented in some classroom lessons. This approach is most often through the use of measurement and grafts within a science lesson. As schools approach the twenty-first century, students need to study the effects that science and social studies have in common.

The Curriculum Standards for Social Studies (NCSS, 1994) states that "the primary purpose of social studies is to help young people develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world" (p. 3). Furthermore, the Social Studies Standards indicate the trends in social, economic, cultural, and scientific areas are leading the western world in new directions. The National Science Education Standards (NRC, 1996) indicate that students need to develop the abilities to inquire and draw conclusions from what they have learned. Scientific literacy is necessary for everyone to make daily choices, engage in intelligent discourse, and be informed in order to debate important scientific and technological issues. An understanding of science is essential in the workplace as more jobs demand advanced skills. Workers need to be able to learn, think creatively, solve problems, reason, and make decisions in order to keep pace with the global markets. Activities involving hands-on experiences are essential but experiences that encourage thinking are needed to develop understanding of science and its relationship to history and the world (NRC, 1996).

The history and nature of science content of the National Science Education

Standards (NRC, 1996) appears to provide a basis for integrating science with social studies instruction. History indicates a strong connection between social issues and events and scientific discoveries and developments. Students need the opportunity to study the relationship between history, societal issues, and science in order to develop their ability to be inquiring and responsible citizens in a world of technological advances.

National Science Education Standards (NRC, 1996) of science in personal and social perspectives allows middle school students the opportunity to study the role of technology as it relates to personal and societal issues. Students are given the opportunity to study the risks and personal decisions that must be weighed for and against the common good of society. Studies can include pollution and environmental degradation and the risk to human, plant, and animal health. These studies can be integrated with history, geography, economics, culture, social and political systems, and national identity and citizenship strands of the National Social Studies Curriculum (NCSS, 1994).

The science and technology content area of the National Science Standards allow students to develop an understanding of technology and its products and systems through problem solving, developing a product, and appreciating the many factors involved with technology development. Integrating this content area with social studies gives the student a clearer idea about the relationship between science and social studies. As the integration of curricula areas increases within classrooms, the integration of science and social studies instruction can be used successfully. The (a) science and technology standard, (b) science in personal and social perspectives standard, and (c) the history and nature of science standard of the National Science Education Standards (NRC, 1996) can be integrated into lesson plans for the fifth grade Mississippi State Department of Education Curriculum Guidelines for Social Studies (MSDE, 1995).

Statement of Purpose

The major purpose of this study was to create lesson plans which integrate the science content areas of (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science with social studies competencies within the Mississippi State Department of Education Curriculum Guidelines (MSDE, 1995) for fifth grade. Therefore, the educational significance of this study was to improve instructional practices in science and social studies through curriculum integration.

Statement of the Problem

This study was designed to create lesson plans by which (a) the science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science of the National Science Education Standards (NRC, 1996) could be integrated with the fifth grade social studies competencies outlined by the Mississippi State Department of Education Curriculum Guidelines for Social Studies (MSDE, 1995). The competencies conform with the Curriculum Standards for Social Studies from the National Council for the Social Studies (1994).

Questions to be Answered

This study was designed to answer the following questions:

1. What is the importance of integrating science standard content areas and social studies competency instruction within a lesson plan?
2. What are some teaching methods by which science standard content areas and social studies competencies can be integrated in a fifth grade curriculum?
3. What types of lessons plans can be developed to illustrate the integration of science standard content areas and fifth grade social studies competencies?

4. How can integrating the social studies competencies for fifth grade relate with the science standard content areas for science and technology, science in personal and social perspectives and the history and nature of science of the National Science Education Standards (NRC, 1996)?
5. What evaluation technique(s) can be used to evaluate the integrated science and social studies curriculum?

Delimitations and Limitations of the Study

The study was delimited to the Mississippi State Department of Education Curriculum Guidelines and Objectives for Social Studies (Mississippi State Department of Education [MSDE], 1995). Only the competencies for the fifth grade level were used. Three content areas from the National Science Education Standards (NRC, 1996) were used. They were (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science. These areas were chosen because of their relationship to the social studies areas of history, geography, economics, culture, social and political systems, and national identify/citizenship.

Definition of Terms

The following terms used in the study are defined as follows:

Curriculum. Curriculum is defined according to the National Science Education Standards (NRC, 1996) as "the way content is delivered: It includes the structure, organization, balance, and presentation of the content in the classroom" (p. 22).

Integrating. For the purpose of this study, Webster's (1995) definition of integrating "to make into a whole by bringing all parts together and to join with something else" (p. 576) will be used.

Bloom's Taxonomy: Synthesis. Bloom's (1993) definition from the Mississippi Teacher Assessment Instrument (MSDE, 1996) used is "the ability to put parts together to form a new whole" (p. 87).

History and Nature of Science. According to the National Science Education Standards (NRC, 1996), history and nature of science can be defined as a changing reflection of scientific history that can be used to clarify different aspects of scientific inquiry, human aspects of science, and the role that science has played in the development of various cultures.

Science in Personal and Social Perspectives. The National Science Education Standards (NRC, 1996) define science in personal and social perspectives as a foundation for students to understand personal and social issues in order to develop decision-making skills.

Science and Technology Standards. Defined by the National Science Education Standards (NRC, 1996) as emphasis on the process of design and understandings about science and its link with technology through development of student's abilities to identify and state a problem, design and implement a solution, and evaluate the solution.

Science. Science is defined for this study as knowledge and understanding of the natural world and how it can relate to and be useful to mankind. Man-made technology is included in the study of science. A method of inquiry is used to answer questions relating to the natural world and technology (NRC, 1996).

Social Studies. Social Studies is defined as a multidisciplinary and interdisciplinary study that promotes citizenship education. Incorporated within social studies are many disciplines such as geography, economics, history, law, religion, and sociology (NCSS, 1994).

Methodology of the Study

The methodology used for this study consisted of reviewing the literature related to integrating curriculum and integrating science and social studies within the curriculum. Competencies from the Mississippi State Department of Education for social studies will be reviewed and correlated to the National Science Education

Standards (NRC, 1996) of (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science. This study examined the competencies for fifth grade social studies in Mississippi and integrated the three content areas to meet implications of National Science Education Standards (NRC, 1996) and National Social Studies Standards (NCSS, 1994) directly or indirectly. A curriculum package of lesson plans at the fifth grade level using the Mississippi State Department of Education Curriculum Guidelines and Objectives for Social Studies (MSDE, 1995) and the National Science Education Standards (NRC, 1996) of (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science was developed. The fifteen competencies of the Mississippi State Department of Education Guidelines and Objectives for Social Studies (MSDE, 1996) at the fifth grade level included a minimum of three lesson plans per competency integrating the content areas of (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science standards selected from the National Science Education Standards (NRC, 1996). The lesson plans included an objective(s), materials, procedure, and evaluation and are intended as a curriculum guide for teachers who wish to integrate science and social studies into their daily lesson plans. Questions to be answered were restated within the methodology.

Organization of the Study

This study is designed to provide a curriculum guide of lesson plans that coordinate with the Mississippi State Department of Education Guidelines and Objectives (MSDE, 1995) for fifth grade social studies curriculum and the National Science Education Standards (NRC, 1996) of (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science. The study will provide a curriculum guide for teachers who wish to integrate science and social studies into their daily lesson plans.

The study is organized into five chapters. Chapter one is an introduction of the purpose, significance, problem, questions to be answered, definitions of terms, delimitations and limitations of the study, and the planned methodology. Chapter two consists of a comprehensive review of the current literature on integrating curriculum of science and social studies and the connection between science-technology-society. Chapter three is the methodology of the curriculum guide using integrated lesson plans and the restating of questions to be answered. Chapter four includes an introduction, summary of competencies and objectives covered in the lesson plans, and recommendations for future development. Chapter five is lesson plans integrating the competencies of the Mississippi State Department of Education Curriculum Guidelines and Objectives for Social Studies (MSDE, 1995) for fifth grade with the (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science of the National Science Education Standards (NRC, 1996). The lesson plans consist of a minimum of three lessons per competency integrating (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science standards for a total of forty-five lesson plans that include the objective(s), materials, procedures, and evaluation.

SUMMARY AND CONCLUSION

Integrated education within the classroom is becoming used more frequently by classroom teachers. Teacher education programs are incorporating the tenets and methods of integrating curriculum to familiarize future teachers with the usefulness of integrated education. A variety of the knowledge and research supporting the usefulness of integrated education is used in teacher education programs. Brain research has shown the usefulness of integrated education with encoding and connecting meaning to information (Walker, 1996). This interdependence of knowledge and processing enables the classroom teacher to immerse students in an environment rich in problem-solving skills, critical analysis skills, ethics, valuing of

knowledge, and communication of learning. A few examples of collaborative learning for science and social studies were found in the literature: Kagan's (1990) Think-Pair-Share for science and Masztal's (1986) cybernetic for social studies.

Textbooks are still considered valuable tools to use for an integrated curriculum. For teachers who are considering integrating science and social studies, the textbooks for science and social studies can provide a foundation for integrated curriculum. Themes should reflect both the curriculum guidelines for the state, and student interests. Usually textbooks will give resources for the teacher to incorporate into an integrated lesson.

Research, as indicated in chapter 2, supports curriculum integration and achievement of students studying in an integrated curricula and those in a conventional curricula were found in the literature. Some research shows increases in motivation, inclusive learning, effectiveness and learning, and efficiency in the integrated curricula classroom. Other research claims that skillful teachers who motivate students and subsequent research does not support effectiveness and efficiency of integrative curriculum. Research on achievement of students in an integrated curricula and students in a conventional curricula claims no difference in achievement.

Focus in social studies (Mullins, 1990) should develop critical thinking and problem-solving skills through in-depth study of topics instead of teaching facts to students. The Curriculum Standards for Social Studies from the National Council for the Social Studies (1994) indicates the primary purpose of social studies is for teachers to help students develop the ability to make informed and reasoned decisions concerning issues and concerns affecting an interdependent world.

The National Science Education Standards (NRC, 1996) emphasize development of student's understandings and abilities through experiences of inquiry. This is achieved through goals of experiencing the richness of knowing and understanding the natural world, learning about appropriate scientific processes and principles for personal decisions, being able to engage in intelligent communication

concerning scientific and technological concerns, and increasing productivity within their careers. Classroom teaching emphasizes hands-on activities and minds-on experiences.

The Curriculum Standards for Social Studies from the National Council of Social Studies (1994) and the National Science Education Standards (NRC, 1996) emphasize the use of inquiry and problem-solving skills to develop critical thinking skills necessary to make informed choices concerning science and social studies issues for today and in the future.

The Mississippi State Department of Education has established guidelines and objectives for social studies across the grades of kindergarten through twelfth. This study of lesson plans used only the competencies for the fifth grade. The six strands of social studies included were history, geography, economics, culture, social and political systems, and national identity/citizenship. Competencies are listed under each strand.

The history strand competencies include:

* The student will understand the causes and effects of past events in American history.
* The student will understand the importance of men, women, and minorities in American history.

The geography strand competencies include:

* The student will demonstrate map and globe skills, relating them to United States history.
* The student will understand geographic concepts of location and region.
* The student will understand human environmental interaction.

The economics strand competencies include:

* The student will understand basic economic concepts.
* The student will understand economic exchange systems.

The culture strand competencies include:

* The student will understand cultural similarities and differences.

* The student will appreciate the presence of ethics and belief systems in all societies.

The social and political systems strand competencies include:

* The student will understand the concept of law.
* The student will understand the various levels of government.

The national identity/citizenship strand competencies include:

* The student will understand the development of democracy in America.
* The student will understand democratic behavior.
* The student will understand the roles of leaders.
* The student will understand the importance of human rights.

(MSDE, 1995).

Each of the fifteen competencies were used in the development of lesson plans for this study.

The National Science Education Standards (NRC, 1996) include more than the three standards used in the development of the lesson plans for this study. The three standards chosen correlate well with the social studies competencies for Mississippi at the fifth grade level. Science standards chosen were:

* Science and technology
* Science in personal and social perspectives
* History and nature of science.

These three standards could be integrated with the social studies competencies easily. They showed the relationship between social studies and science and the effects that each have upon the other.

The lesson plans included a social studies competency with each of the three science standards. An objective incorporating both the competency and a standards was written along with a procedure or activity, a list of materials needed to accomplish the activity, and some form of evaluation to determine if the objective was met by the students.

Organization of the social studies competencies and science standards are as follows:

History

The student will understand the causes and effects of past events in American history (Social Studies) with the *Science and Technology Standard*.

The student will understand the causes and effects of past events in American history (Social Studies) with the *Science in Personal and Social Perspectives Standard*.

The student will understand the causes and effects of past events in American history (Social Studies) with the *History and Nature of Science Standard*.

The student will understand the importance of men, women, and minorities in American history (Social Studies) with the *Science and Technology Standard*.

The student will understand the importance of men, women, and minorities in American history (Social Studies) with the *Science in Personal and Social Perspectives Standard*.

The student will understand the importance of men, women, and minorities in American history (Social Studies) with the *History and Nature of Science Standard*.

Geography

The student will demonstrate map and globe skills, relating them to United States history (Social Studies) with the *Science and Technology Standard*.

The student will demonstrate map and globe skills, relating them to United States history (Social Studies) with the *Science in Personal and Social Perspectives Standard*.

The student will demonstrate map and globe skills, relating them to United States history (Social Studies) with the *History and Nature of Science Standard*.

The student will understand geographic concepts of location and region (Social Studies) with the *Science and Technology Standard*.

The student will understand geographic concepts of location and region (Social

Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand geographic concepts of location and region (Social Studies) with the *History and Nature of Science Standard.*

The student will understand human environmental interaction (Social Studies) with the *Science and Technology Standard.*

The student will understand human environmental interaction (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand human environmental interaction (Social Studies) with the *History and Nature of Science Standard.*

Economics

The student will understand basic economic concepts (Social Studies) with the *Science and Technology Standard.*

The student will understand basic economic concepts (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand basic economic concepts (Social Studies) with the *History and Nature of Science Standard.*

The student will understand economic exchange systems (Social Studies) with the *Science and Technology Standard.*

The student will understand economic exchange systems (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand economic exchange systems (Social Studies) with the *History and Nature of Science Standard.*

Culture

The student will understand cultural similarities and differences (Social Studies) with the *Science and Technology Standard.*

The student will understand cultural similarities and differences (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand cultural similarities and differences (Social Studies)

with the *History and Nature of Science Standard.*

The student will appreciate the presence of ethics and belief systems in all societies (Social Studies) with the *Science and Technology Standard.*

The student will appreciate the presence of ethics and belief systems in all societies (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will appreciate the presence of ethics and belief systems in all societies (Social Studies) with the *History and Nature of Science Standard.*

Social and Political Systems

The student will understand the concept of law (Social Studies) with the *Science and Technology Standard.*

The student will understand the concept of law (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand the concept of law (Social Studies) with the *History and Nature of Science Standard.*

The student will understand the various levels of government (Social Studies) with the *Science and Technology Standard.*

The student will understand the various levels of government (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand the various levels of government (Social Studies) with the *History and Nature of Science Standard.*

National Identity/Citizenship

The student will understand the development of democracy in America (Social Studies) with the *Science and Technology Standard.*

The student will understand the development of democracy in America (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand the development of democracy in America (Social Studies) with the *History and Nature of Science Standard.*

The student will understand democratic behavior (Social Studies) with the *Science and Technology Standard.*

The student will understand democratic behavior (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand democratic behavior (Social Studies) with the *History and Nature of Science Standard.*

The student will understand the roles of leaders (Social Studies) with the *Science and Technology Standard.*

The student will understand the roles of leaders (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand the roles of leaders (Social Studies) with the *History and Nature of Science Standard.*

The student will understand the importance of human rights (Social Studies) with the *Science and Technology Standard.*

The student will understand the importance of human rights (Social Studies) with the *Science in Personal and Social Perspectives Standard.*

The student will understand the importance of human rights (Social Studies) with the *History and Nature of Science Standard.*

The lesson plans are meant to be use as ideas for teachers to create their own plans for an integrated curriculum. Teachers will need to consider the needs of their curriculum guidelines and objectives mandated by their state department of education. Consideration of learning levels and styles of the classroom needs to be taken into account by teachers.

The review of the literature on integrative education and the integration of science-technology-and society gave information on the importance of integrating curriculum. Walker (1996) felt the emphasis of curriculum integration is the interdependence of knowledge and processes. According to Beane (1993), integrative curriculum bases learning on students asking questions and exploring possible

answers through experiences, development of skills, interaction, and reflection. The question of what is the importance of integrating the science standard content areas for (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science and social studies competency instruction within a lesson plan was answered.

Various methods by which science standard content areas and social studies competencies can be integrated are suggested. Methods can and often include, but are not limited to, writing paragraphs, writing stories, posters, role playing, dioramas, timelines, outlining, webbing of information, bulletin boards, and other methods that the teacher may employ to fit the learning styles of students.

The lesson plans developed are to be used as ideas for teachers to create their own integrated curriculum that will meet their state department of education guidelines and objectives. The plans can and often include, but are not limited to, group activities and individual activities. Each lesson includes an objective, materials, procedure, and evaluation. The fifteen competencies for social studies at the fifth grade level for Mississippi have a lesson plan integrating the competency with (a) science and technology standard, (b) science in personal and social perspectives standard, and (c) the history and nature of science. Therefore, each social studies competency has three lesson plans for a total of forty-five lesson plans.

The social studies competencies for the Mississippi State Department of Education can be integrated with and related to the science standard content areas for (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science of the National Science Education Standards (NRC, 1996). Social studies areas of history, geography, economics, culture, social and political systems, and national identity/citizenship relate to and integrate with the three science standards chosen for this study. The areas of (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science play a role in the history, geography, economics, culture, social and political systems,

and national identity/citizenship of United States history. Through understanding of this relationship that these three areas have with social studies enables students to become literate citizens and better able to make informed decisions about social and scientific issues.

Evaluation technique(s) used to evaluate the integrated science and social studies curriculum lesson plans are infinite in number. Evaluation methods can and often include, but are not limited to, observations, written responses, rubrics, checklists, tests, portfolios, interviews, grading of a product, and product analysis. It is the teacher who can best select the most appropriate evaluation method for a particular lesson.

The lesson plans developed for this study need to be validated, improved, and refined. It is hoped that a positive affect will occur in the instructional practices in science and social studies through curriculum integration. Although the study was narrowed to the use of the Mississippi State Department of Education Curriculum Guidelines and Objectives for Social Studies (MSDE, 1995) at the fifth grade level, any teacher could adapt and integrate at any grade level the curriculum guidelines and objectives for social studies with the three National Science Education Standards (NRC, 1996) of (a) science and technology, (b) science in personal and social perspectives, and (c) the history and nature of science.

INSTRUCTIONAL PACKAGE

Preface to the Lesson Plans

The following instructional package contains a sample of the lesson plans which integrate science and social studies concepts for the fifth grade. This preface explains the structure of the lesson plans and provides suggestions for their utilization. Notes on each lesson plan competency and standard, coding, and each objective follow. Each lesson plan includes the following: objective, materials, procedure, and evaluation. The objective and procedure sections are unique to each plan. By contrast, the materials and evaluation sections are more similar. The materials and

evaluation sections contain a variety of materials and different methods of evaluation the teacher may choose from to implement the lesson plan.

The social studies competencies include concepts in the areas of history, geography, economics, culture, social and political systems, and national identity/citizenship. These competencies are coded within each lesson plan and are as follows:

Mississippi State Department of Education Curriculum

Guidelines and Objectives for Social Studies

HISTORY

H.1 The student will understand the causes and effects of past events in American history.

H.2 The student will understand the importance of men, women, and minorities in American history.

GEOGRAPHY

G.3 The student will demonstrate map and globe skills, relating them to United States history.

G.4 The student will understand geographic concepts of location and region.

G.5 The student will understand human environmental interaction.

ECONOMICS

E.6 The student will understand basic economic concepts.

E.7 The student will understand economic exchange systems.

CULTURE

C.8 The student will understand cultural similarities and differences.

C.9 The student will appreciate the presence of ethics and belief systems in all societies.

SOCIAL AND POLITICAL SYSTEMS

SPS.10 The student will understand the concept of law.

SPS.11 The student will understand the various levels of government.

NATIONAL IDENTITY/CITIZENSHIP

NIC.12 The student will understand the development of democracy in America.

NIC.13 The student will understand democratic behavior.

NIC.14 The student will understand the roles of leaders.

NIC.15 The student will understand the importance of human rights.

There are three National Science Education Standards (NRC, 1996) used in the lesson plans. The three standards are (a) science and technology standard, (b) science in personal and social perspectives standard, and (c) the history and nature of science standard. The Science and Technology Standard is defined as placing emphasis on the process of design and understandings about science and its link with technology through development of student's abilities to identify and state a problem, design and implement a solution, and evaluate the solution. The Science in Personal and Social Perspectives Standard is defined as a foundation for students to understand personal and social issues in order to develop decision-making skills. The History and Nature of Science Standard is defined as a changing reflection of scientific history that can be used to clarify different aspects of scientific inquiry, human aspects of science, and the role that science has played in the development of various cultures. These standards are coded within each lesson plan and are as follows:

ST Science and Technology Standard

SPSP Science in Personal and Social Perspectives Standard

HNS History and Nature of Science Standard

The lesson plans that follow are coded for easy use. For example, H.1/ST/G or I is a lesson plan that integrates History Competency # 1 (H.1) with the science standard of Science and Technology (ST) that can be used with a group of learners (G) or with individual students (I).

Notes on Lesson Plan Materials

Lesson plan materials suggested include reference materials, reading materials, instructional materials, resource people, supplies, and media. "Reference materials" includes an infinite number of resources teachers have at their disposal. References can and often include, but are not limited to, reading materials, instructional materials, supplies, resource persons, and teacher/media materials. Some examples of materials in each of these categories appear below and will be briefly referenced to within each lesson plan; however, it is the teacher who is always in the best position to select the most appropriate materials for a particular lesson. Therefore, the users of these lesson plans are encouraged to simply use the plans as a point of beginning and modify them as needed relative to the specifics of their situation.

Reading Materials includes trade books, science textbooks, social studies textbooks, magazines, newspapers, and other materials students can read.

Instructional Materials includes teacher made science and social studies kits, commercial science and social studies kits, resources from museums, companies, and institutions, globes, maps, artifacts, and others.

Resource Persons includes speakers from the community, companies, institutions, other faculty, parents, and others.

Supplies includes, but are not limited to, paper, pencils, crayons, markers, colored paper, construction paper, graph paper, scissors, glue, rulers, boxes, yarn, fabric scraps, felt.

Media includes computers, VCR, TV, tape recorders, calculators, slide projectors, video tapes, recordings, and other multi-sensory media.

Notes on Lesson Plan Procedures

The lesson plan procedures include, but are not limited to, written papers, outlines, charts, webs, posters, timelines, media presentations, writing and producing plays, writing stories, dioramas and models, debates, bulletin boards, presentations, graphs, collecting items, writing news reports, writing books. It is the teacher who is in

the best position to select the most appropriate procedure to accommodate student learning levels and styles.

Notes on Lesson Plan Evaluations

The lesson plan evaluations suggested are observations, written responses, rubrics, checklists, tests, portfolios, interviews, grading of a product, and product analysis. Evaluation methods will be briefly referenced to within each lesson plan; however it is the teacher who is always in the best position to select the most appropriate evaluation method for a particular lesson. Therefore, the users of these lesson plans are encouraged to simply use the plans as a point of beginning and modify them as needed relative to the specifics of their situation.

The student will understand the impact of technology on the causes and effects of past events in American history.

Objective:

The students will describe the results to American society that the development of the railroad system had on western expansion in the United States.

Materials:

Reference materials, reading materials, resource people (railroad workers, historians).

Procedure:

Students can use reference materials to research the results to American society that the development of the railroad system had on western expansion in the United States.

1. Students can choose to write a two page paper describing the results to American society that the development of the railroad system had on western expansion in the United States and illustrate their writing,

AND/OR

2. They can choose to do an outline showing the results to American society that the development of the railroad system had on western expansion in the United States and illustrate their outline.

Evaluation:

The teacher evaluates using various methods.

The student will demonstrate map and globe skills and understand how science and technology can help develop maps and globes related to United States history.

Objective:

The student will demonstrate the steps used to make a special purpose map such as a climate map, a vegetation map, or a population map.

Materials:

Reading materials, resource people (geography specialists, meteorologists), instructional materials, media materials.

Procedure:

Students can use reference materials to select and research the scientific and technological steps used to make a special purpose map.

Students will:

1. demonstrate the steps used to make a special purpose map through an oral presentation, a computer assisted presentation, or a visual presentation.

Evaluation:

The teacher evaluates using various methods.

The student will understand basic economic concepts and its relationship to science and technology.

Objective:

The student will illustrate how science and technology have improved transporting food goods over the past one hundred years.

Materials:

Reading materials, media resources, reference materials.

Procedure:

Students will research how science and technology have improved transporting food goods over the past one hundred years.

Students will:

1. create models of food transportation over the past 100 years.

AND/OR

2. produce a pictorial timeline of food transportation over the past 100 years.

AND/OR

3. design a food transportation system of the future.

Evaluation:

The teacher evaluates using various methods.

The student will understand cultural similarities and differences in relation to personal and social perspectives of science.

Objective:

The student will relate the contributions of Native Americans to the survival of the early colonists and their impact on society.

Materials:

Reading materials, books on Native Americans, reference materials, media materials, resource people.

Procedure:

Students can research the contributions of Native Americans to the survival of the early colonists and their impact on society.

Students will:

1. write a two page report on the contributions of Native American to the survival of the early colonists and their impact on society.

AND/OR

2. search the Internet on Native American culture and create a computer presentation detailing the impact on early colonists and society.

Evaluation:

The teacher evaluates using various methods.

The student will understand the concept of law related to personal and social perspectives in science.

Objective:

The student will justify the importance of laws dealing with the environment and its impact on personal and social perspectives.

Materials:

Reading materials, reference materials, resource people, media materials.

Procedure:

Students can research a law(s) dealing with the environment and its impact on personal and social perspectives.

Students will:

1. create a bulletin board illustrating the importance of laws.

AND/OR

2. create new laws dealing with the environment and personal and social perspectives. Present to the class for a debate and vote.

Evaluation:

The teacher evaluates using various methods.

The student will understand the roles of leaders concerning the history and nature of science.

Objective:

The student will identify the role that government leaders have played concerning the history and nature of science.

Materials:

Reading materials, reference materials, resource people (lobbyist, political leaders, scientists).

Procedure:

Students can select a scientific discovery or contribution and research the role that government leaders have played concerning the discovery or contribution.

Students will:

1. write a two page story about the scientific discovery or contribution and the role that government leaders have played concerning the discovery or contribution.

Evaluation:

The teacher evaluates using various methods.

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